

U.S. NUCLEAR REGULATORY COMMISSION
REGION I

Report No. 50-410/85-31

Docket No. 50-410

License No. CPPR-112 Priority -- Category A

Licensee: Niagara Mohawk Power Corporation
300 Erie Boulevard, West
Syracuse, New York 13202

Facility Name: Nine Mile Point, Unit No. 2

Inspection At: Scriba, New York

Inspection Conducted: October 7 - 11, 1985

Inspectors: *H. I. Gregg* 11-7-85
for K. A. Manoly, Lead Reactor Engineer date

H. I. Gregg 11-7-85
for R. M. Campbell, Engineering Technician date

Approved by: *Harold I. Gregg* 11-7-85
for J. T. Wiggins, Chief Materials and Processes Section, Engineering Branch, Division Reactor Safety date

Inspection Summary: Inspection on October 7 - 11, 1985 (Report No. 50-410/85-31)

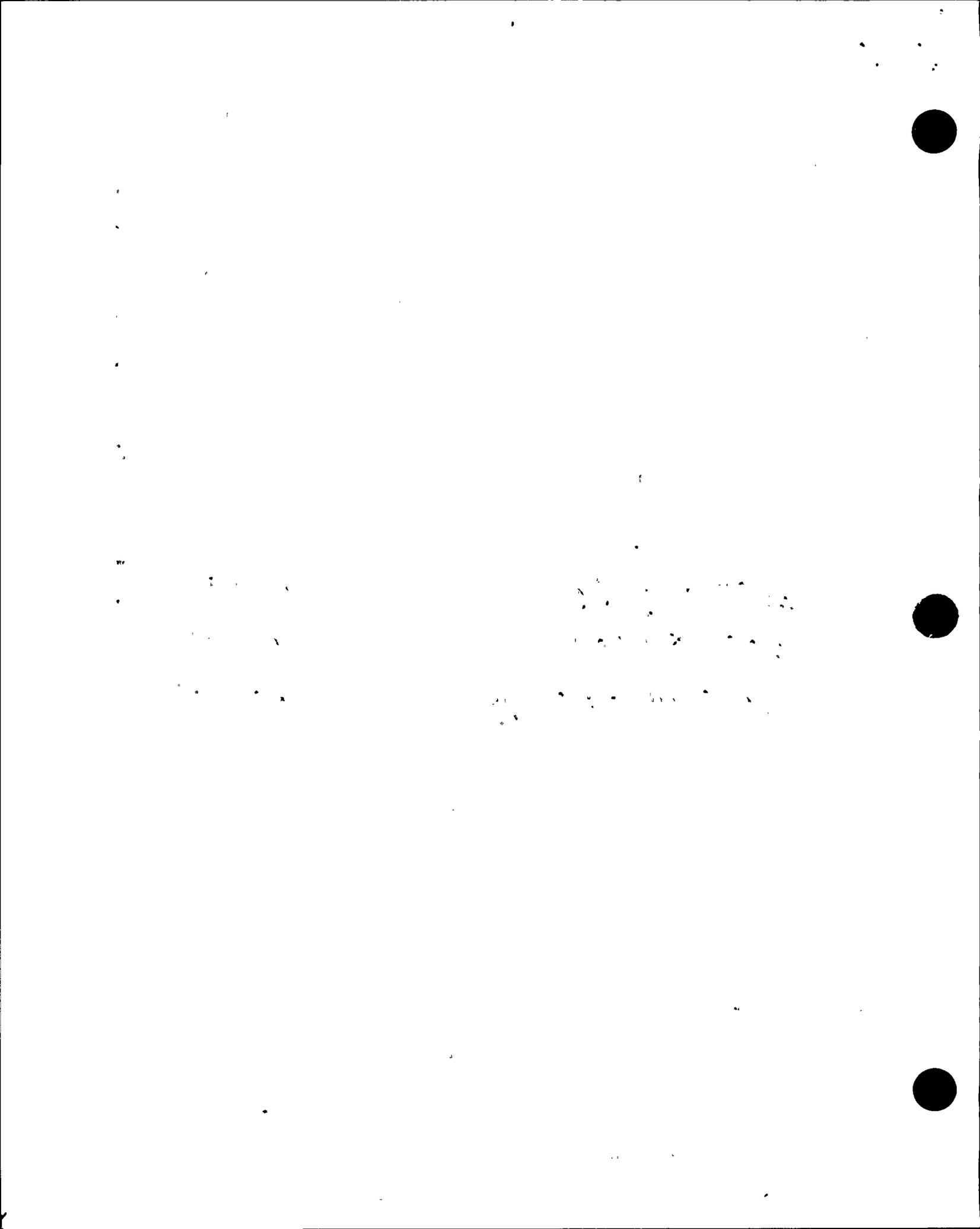
Areas Inspected: Routine unannounced inspection, by one region-based inspector and one engineering technician, for review of licensee activities in the following areas:

- Problems identified on previously FQC-accepted ITT-Grinnel large bore pipe supports.
- As-built stress reconciliation of Category I piping systems installed by Grinnell and Stone and Webster.

The inspection involved 72 hours on site.

Results: No violations were identified. However, one unresolved item was identified related to the adequacy of the licensee's sample size for pipe support reinspections.

8511180326 851112
PDR ADOCK 05000410
PDR



DETAILS

1. Persons Contacted

Niagara Mohawk Power Corporation (NMPC)

D. Hess, QA Engineer
J. White, Special Projects Engineer
B. Morrison, Quality Engineering Manager
T. Kolceski, Special Projects Engineer
M. Ray, Assistant to Project Director
D. Quamme, Project Director
W. Baker, Special Projects Engineer
C. Beckham, Q.A. Manager
G. Griffith, Licensing Coordinator
T. Lee, Special Projects Engineer
R. Matlock, Project Director
L. Prunoffo, Lead Structural Engineer
R. Sallee, Welding & NDE QA Engineer

Stone and Webster Engineering Corporation (SWEC)

C. Terry, Project QA Manager
R. Hyslop Jr., Site Licensing Engineer
J. Gallagher, Site Licensing Engineer
W. Taylor, Assistant Superintendent, FQC
R. Maxon, QA Supervisor
J. Seely, QC Inspection Supervisor
A. Pinter, FQE Special Projects Engineer

ITT Grinnell

F. Zinkevich, Director QA/QC
L. Pela III, QC Manager

U.S. Nuclear Regulatory Commission

R. A. Gramm, Senior Resident Inspector

The above listed personnel attended the exit meeting on October 11, 1985. Other managers, supervisors, craftsmen and technicians were contacted during the course of the inspection.

2.0 ITT-Grinnell Large Bore Pipe Support Installations

2.1 General

The objective of this inspection was to review the licensee's (NMPC) program for the inspection, evaluation and disposition of identified discrepancies on previously FQC accepted ITT-Grinnell (ITT-G) large bore (L/B) pipe support installations.



The L/B pipe support problems were identified during the NRC Construction Appraisal Team (CAT) and various regional inspections in addition to NMPC surveillance activities.

To achieve the above objectives, an inspection plan was developed for the evaluation and assessment of the various steps involved in the licensee's program. The plan included a sampling inspection by the NRC of L/B pipe support installations and a review of the engineering evaluation performed to address the identified discrepancies. The inspection plan focused on L/B pipe support installations which were completed and accepted by ITT-G FQC at selected time periods in addition to other supports randomly selected by the NRC inspector. The review of the engineering evaluation, however, was focused on the generic acceptance criteria developed by Stone and Webster (SWEC) for the disposition of identified weld related discrepancies and included a sampling review of evaluation packages for selected supports.

2.2 Large Bore Pipe Support Problems

The first phase of reinspection of L/B pipe supports was conducted by NMPC and SWEC on installations accepted by ITT-FQC before November 1984. The sample included a total of 175 supports of which 50 were inspected by NMPC and 125 by SWEC. As a result of this Phase 1 reinspection, 88 supports were found to not meet certain attributes in the specification for field fabrication and erection of pipe supports. The reinspection effort covered various welding and mechanical attributes. The non-conforming welding attributes included undersize, underlength, undercut and overlap. The nonconforming mechanical attributes included: tightness of bolted connections, support gaps, support clearances, arc strikes, damage, dents, gouges, excessive grinding, anchor bolt length and identification and other miscellaneous attributes.

The licensee attributed the cause of the above-described nonconformances to the lack of inspection tolerances in the installation specification and to the exercise of judgement by FQC personnel during their acceptance of support installations.

11

12

13

14

15

16



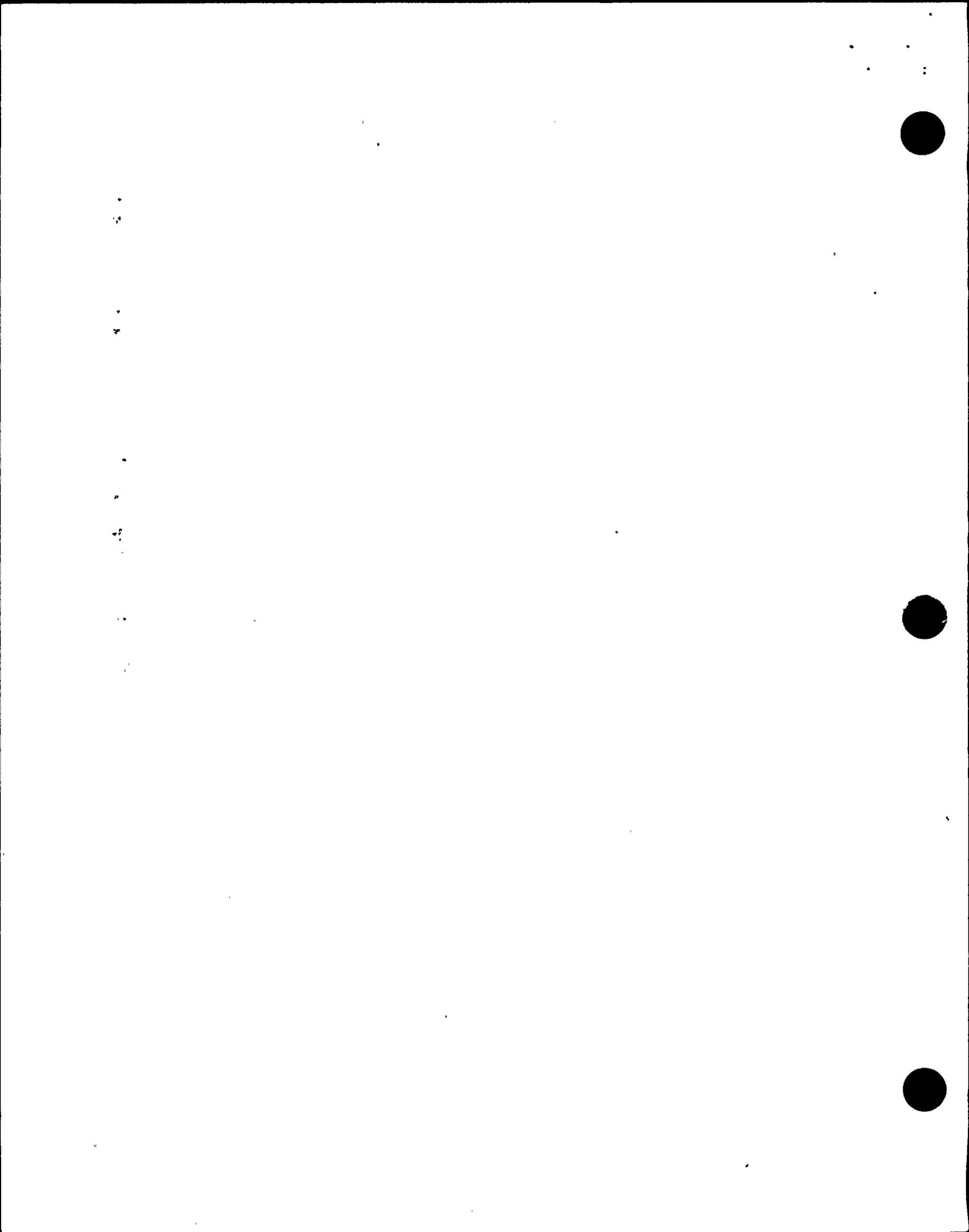
Upon evaluation of the nonconforming attributes in the supports which failed the reinspection, SWEC determined that the welding deficiencies would not prevent the piping and pipe support system from performing their intended functions. SWEC also indicated that the loose hardware and other mechanical problems were expected to occur during construction and that ITT-G's program for final turnover walkdown of completed systems would capture these deficiencies. Thus, the licensee and SWEC concluded that these deficiencies were not reportable under 10 CFR 50.55(e).

In addition, SWEC initiated various action items related to the engineering evaluation of the identified pipe support discrepancies. The action items included the following:

- Issuing a report of SWEC's engineering review of discrepancies which concluded that large bore pipe supports were acceptable to engineering and therefore further reinspection of pipe supports covered in Phase I was not required.
- Issuing various Engineering and Design Coordination Reports (E&DCR's) to provide inspectors with tolerances for weld size and other weld related imperfections in addition to addressing material defects, measurement accuracy and an acceptance criterion for certain dimensions in the support configurations.
- Requiring ITT-G to revise its procedure for final system walkdown (FQC 4.2-26) to include a review of pipe supports for various nonconforming mechanical attributes such as gaps between piping and supports, clearance between pipe supports and adjacent components, arc strikes, and loose pipe support hardware which could occur after the final FQC installation inspection of completed piping components and supports (i.e. the 5X - inspection).

With regard to the requirement for pipe support reinspection, SWEC instructed ITT-G that:

- Supports that were 5X-inspected prior to December 1984, did not require reinspection for attributes found acceptable by SWEC E&DCR's (i.e. weld deficiencies).
- All supports that were 5X-inspected prior to December 1, 1984 and whose accepted condition subsequently changed due to the identification of mechanical deficiencies, during the Phase I re-inspection, were to be reinspected for the amount of rework performed.



- All supports that were 5X-inspected subsequent to December 1984, were to be reinspected for welding and mechanical attributes found deficient during the Phase I effort (i.e. welds, bolts, etc.).

ITT-G pipe support installations which received 5X-inspection between December 1984 and July 1985 were reinspected by SWEC on a sampling basis during Phase II of the reverification process. A sample size of 127 was selected from a lot size of 1232 large bore pipe supports. Resulting from the Phase II reinspection, five (5) supports were rejected on the basis of welding attributes and twenty four (24) on the basis of mechanical type attributes.

The rejected attributes were similar to those identified in the first reinspection (Phase I). SWEC engineering evaluated the results and determined that the supports were acceptable as-is.

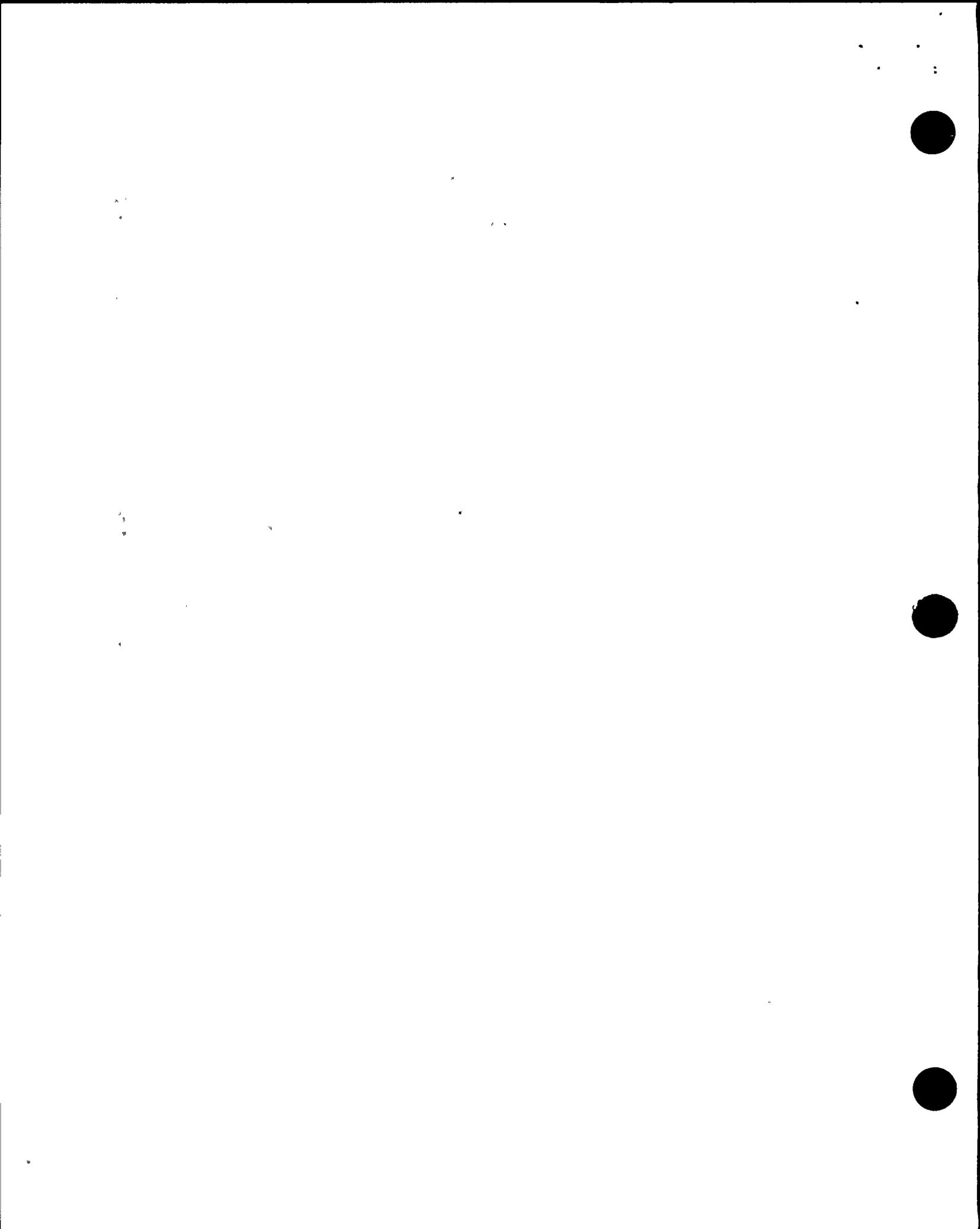
The Phase II reinspection effort was concluded in July 1985. The number of L/B supports which were completed and 5X-inspected between July and October 1985 was estimated to be thirty three (33). These supports were considered during the inspection as the Phase III batch.

2.3 Review of NMPC Corrective Action Programs

As outlined in section 2.1, an inspection plan was developed to assess the significance of the identified ITT-G L/B support reinspection discrepancies and the adequacy of the licensee's corrective action.

The steps undertaken by the inspector to perform this assessment included:

1. Several meetings which were held with cognizant NMPC, SWEC, and ITT-G personnel from QA, QC and engineering to establish an overall perspective for the various activities undertaken in relation to ITT-G support problems.
2. Review of numerous transmittals, internal memoranda, letters etc. issued by NMPC, SWEC and ITT-G between November and July 1985. The documents reviewed are identified in Attachment 2A to this report.
3. Review of various specifications and QC procedures related to the fabrication, erection, inspection and verification of pipe support installations. The documents reviewed are identified in Attachment 2C to this report.



4. Visual and physical inspection of L/B support installations including independent measurements of weld sizes and lengths. The total number sampled in this inspection was thirty seven (37) supports. The sample included ten (10) supports from those reinspected by SWEC in Phase I, nine (9) supports from the (1232) population in Phase II (excluding those already reinspected by SWEC), and nine (9) supports from the Phase III population. In addition, nine (9) other L/B supports were randomly selected for inspection. Identification of the inspected supports is provided in Attachments 1A, 1B, 1C and 1D respectively.
5. Review of the licensee's generic evaluation of identified support reinspection discrepancies. Those SWEC's documents which provided the basis for the revised FQC inspection criteria and which were reviewed by the NRC are identified in Attachment 2A to this report.
6. Review of a sample of SWEC's engineering evaluation packages for disposition of discrepancies identified during the Phase II reinspection. The review included eight (8) support packages which are tabulated in Attachment 2B along with the identified concerns.

2.4 Findings

The following items were identified during the NRC's assessment of ITT-G large bore pipe support installations.

1. Four large bore pipe supports were found to have mechanical and/or hardware related non-conformances.
 - a. BZ-196F: An arc strike was found on the final inspected support.
 - b. BZ-76Q: Locknuts on sway strut were loose and an instrument tubing hanger was located within 1/8 of an inch of the support.
 - c. BZ-72TE: No torque seal was visible on the lock nuts of the support and the snubber was found to be in a bound condition in relation to the clamp.
 - d. BX-72KK: An unacceptable angle (greater than 2°) was found between the snubber and clamp on the support assembly.

ITT-G performed an inspection of the above supports and identified the same nonconformances found by the NRC inspectors. Four inspection reports were issued by ITT-G indicating the above stated nonconformances.



The NRC inspector determined that these discrepancies were similar to those identified by SWEC in its Phase I and II reinspections. The licensee stated that the NRC identified nonconformances had occurred after the ITT-G final (5X) inspection of the support installations. Further, the licensee reiterated that these types of discrepancies were bound to occur as long as the construction crew remained at work on other installations in proximity to the accepted L/B supports.

As indicated earlier in the report, these types of mechanical and hardware non-conformances should be captured in ITT-G final system walkdown before turnover to SWEC. The licensee's response was deemed acceptable regarding the identified findings. This item, however, will be tracked by the NRC as a continuation to the CAT's IFI (410/83-18-B1).

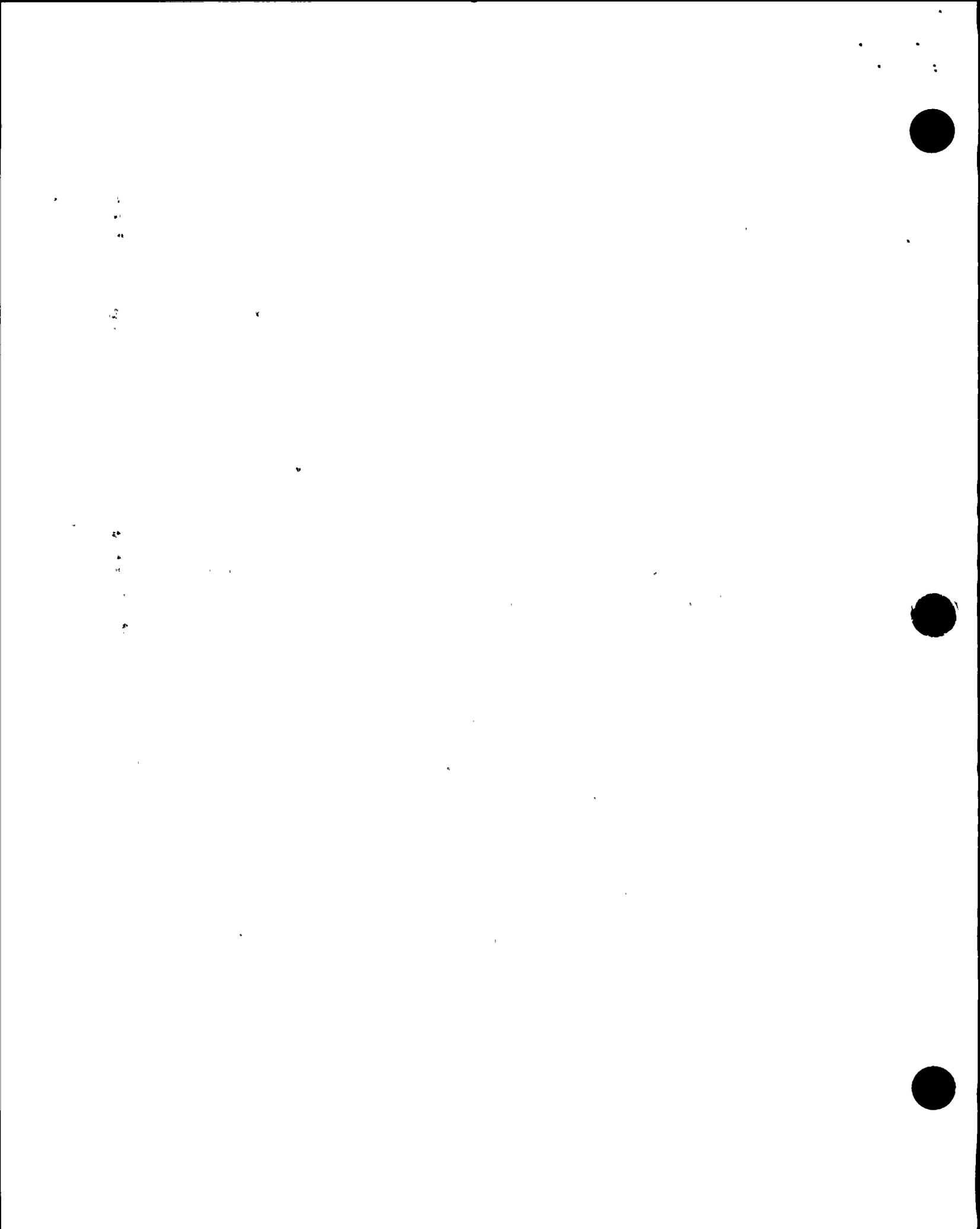
2. During the review of SWEC's engineering calculation No. 517.45.05-NZ(C)-121 which provided the technical justification for weld length tolerance criteria (E&DCR FO2174A), a concern was identified regarding the built-in margin in weld design. SWEC's calculations were found to account for a minimum of 4% available design margin in welds. This 4% margin and other margins resulting from increased weld allowable stresses (18 ksi to 21 ksi) were combined with an allowance for weld undersize by 1/16" for up to ten percent of weld length to establish an acceptance criterion for reduced weld length. The built-in design margin of 4%, however, was based on a sampling review of thirty (30) L/B pipe support design calculation packages. The sample size was found to be significantly below the requirements in SWEC's Quality Assurance Directive QAD-7.11 for sampling inspections. According to the procedure, a sample size of 200 would be required for a batch size between 3201 and 10,000. The total number of ITT-G Category I large bore pipe supports is approximately 5500 supports.

The licensee acknowledged the NRC concern and indicated that the design built-in margin will be reevaluated on the basis of a sample of 200 supports. This item is unresolved pending the licensee's evaluation and NRC review (410/85-31-01).

3.0 Piping and Pipe Support As-Built Stress Reconciliation Program

3.1 General

A review of the piping stress reconciliation program was conducted during this inspection for piping systems designed by SWEC and installed by both SWEC (small bore (S/B)) and ITT-G (large bore (L/B)). Stress reconciliation activities related to piping systems designed by GE and installed by RCI were addressed in NRC Inspection Report No. 410/85-25. The objective of the review conducted during this



inspection was to evaluate the stress reconciliation activity and verify its conformance to FSAR commitments and NRC regulations. The review was also intended to assess the effectiveness of the program in its interface with the ITT-G final system walkdown and the ASME N-5 certification program.

To achieve the above objectives, the inspector performed a review of applicable documents (Attachment 3) affecting this activity in addition to conducting interviews with several SWEC and ITT-G engineering personnel. Specific reviews of completed piping stress reconciliation packages and as-built installations were not performed during this inspection since the final ITT-G's systems walkdown and SWEC's Phase two of stress reconciliation have just begun (approximately 1% complete).

3.2 Overview of the Stress Reconciliation Program

The principal activities involved in this program are governed by: procedures for in-process field verification of piping geometry and pipe support locations for large and small bore piping systems; quality control instructions for FQC verification of as-built L/B and S/B piping systems; and, the procedure for final reconciliation of Category I pipe stress and supports.

Large and small bore piping and pipe support as-built verification activities are coordinated between SWEC site and Cherry Hill Operations Center (CHOC) by an As-Built Coordinator (ABC).

The following information is verified by the Site Engineering Group (SEG) walkdown teams for large bore isometrics:

- pipe support BZ numbers
- location of the pipe support and branch connections along the pipe in relation to a fitting, valve, penetration, equipment, change in direction or other known point along the pipe
- valve description and mark numbers
- valve orientation to within $\pm 5^\circ$
- all dimensions required for verification of overall piping geometry.
- pertinent information such as link seals, branch connection types, elbow bends, fittings and line numbers.



The field procedure for verification of L/B piping provides instructions for initial verification of partial and completed as-builts in addition to the final verification of completed as-builts. Field QC in-process verification of L/B piping and support systems is performed on a 10% randomly selected sample for verification of as-built dimensions using controlled copies of initial as-built drawings. Using the 10% selected sample, FQC performs a 100% verification of the data recorded by SWEC construction to be within $\pm 2''$ of the installed condition. FQC verification includes verification of hanger function, piping system configuration and valve orientations. Final as-built FQC verification is performed on 100% of the final as-built drawings and includes similar attributes as those addressed during the in-process verification.

As-built verification of small bore piping and pipe supports is coordinated by the ABC through a senior small bore engineer and a senior ASME control group engineer. Preparation of small bore as-built drawings is accomplished by updating all related Category I drawings to as-built status and inclusion of all outstanding ACN's, E&DCR's and N&D's. New revisions of the isometrics are then stamped as verification copies and issued to FQC for performing final verification of as-installed dimensions shown on the drawing.

FQC verification of small bore piping and support system includes the following:

- 100% verification of the hangers shown in the drawing to insure that they are located within required tolerances.
- hanger function
- isometrics depict the configuration of the installed piping systems.

Stress reconciliation of large and small bore computer analyzed piping systems is performed at SWEC-CHOC utilizing field-marked and FQC-verified piping isometrics in addition to check lists pertinent information. Flow charts for large and small bore as-built piping review, as presented in reference No. 5 of Attachment 3 to this report, are provided in Figures 1 and 2 respectively.

3.3 Findings

No violations were identified during the review of the piping and pipe support as-built stress reconciliation program.

4. Unresolved Items

Unresolved items are matters about which information is required in order to ascertain whether they are acceptable items, violations or deviations. An item remaining unresolved in this inspection is discussed in Section 2 of this report.



5. Exit Meeting

An exit meeting was held on October 11, 1985 with members of the licensee's staff and contractors as denoted in Section 1 of this report. The inspector discussed the scope and findings of the inspection. At no time during this inspection was written material provided to the licensee by the inspector.



ATTACHMENT 1A

REACTOR BUILDING
NRC LARGE BORE PIPE SUPPOR INSPECTION

DRAWING NUMBER	SUPPORT NUMBER	ELEVATION	COMMENTS
BZ 19 EG-3	2SWP-PSR 817A3	185'	Accept
BZ 19 PW-4	2SWP-PSR 493A3	240'	Accept
BZ 19 HN-3	2SWP-PSR 897A3	192'	Accept
BZ 19 QH-2	2SWP-PSST 504A3	249'	Accept
BZ 11 CN-2	2SVV-PSR 107A3	244'	Accept
BZ 11 SV-2	2SVV-PSR 499A3	245'	Accept
BZ 11 KW-2	2SVV-PSST 367A3	242'	Accept
BZ 19 VH-1	2SWP-PSR 653A3	192'	Accept
BZ 19 MD-2	2 SWP-PSR 404A3	220'	Accept
BZ 11 AAA-2	2SVV-PSST 691A3	260'	Accept



ATTACHMENT 1B

REACTOR BUILDING
NRC LARGE BORE PIPE SUPPORT INSPECTION

DRAWING NUMBER	SUPPORT NUMBER	ELEVATION	COMMENTS
BZ 71 ADX-2	2RHS-PSSP 187A2	180'	Accept
BZ 76 CQ-1	2ICS-PSST 235A2	183'	See Findings in Section 2.4
BZ 76 CK-1	2ICS-PSSP 230A2	175'	Accept
BZ 74 AD-1	2WCS-PSP 447A3	215'	Accept
BZ 78 T-2	2CSH-PSR 012A2	208'	Accept
BZ 78 HR-1	2CSH-PSR 202A2	198'	E&DCR (C19396-C17276 Issued for incorporating Design Changes to DWG
BZ 74 LJ-1	2WCS-PSSH 698A1	250'	Accept
BZ 78 BZ-1	2CSH-PSST 067A2	178'	Accept
BZ 71 CS-1	2RHS-PSSH 082A2	192'	Non-Conformance Report #168578 Issued for Pipe Clamp Over Pipe Weld, and Angularity Problems



ATTACHMENT 1C

NINE MILE #2

REACTOR BUILDING

NRC-LARGE BORE PIPE SUPPORT INSPECTION

DRAWING NUMBER	SUPPORT NUMBER	ELEVATION	COMMENTS
BZ 72 SN-2	2CCP-PSSH 847A3	260'	Accept
BZ 72 TE-1	2CCP-PSSP 862A3	260'	See Findings Section
BZ 72 KE-1	2CCP-PSSP 640A3	260'	ACN #04121 Issued For Additional Snubber Attachment
BZ 72 KK-1	2CCP-PSSP 645A3	260'	See Findings Section
BZ 72 RM-1	2CCP-PSSP 818A3	260'	Inspection Report 85-09 No. 18722 Issued for Removal of Snubber
BZ 72 RN-2	2CCP-PSSP 819A3	261'	Accept
BZ 72 RS-1	2CCP-PSSP 823A3	259'	E&DCR Issued for Design Changes on BZ Drawing. (E&DCR #C90057)
BZ 72 UH-1	2CCP-PSSP 889A3	260'	Accept
BZ 72 UL-2	2CCP-PSSP 894A3	260'	Accept



ATTACHMENT 1D

NINE MILE #2

REACTION BUILDING/AUXILIARY BUILDING
NRC LARGE BORE PIPE SUPPORT INSPECTION

DRAWING NUMBER	SUPPORT NUMBER	ELEVATION	COMMENTS
BZ 72 UB-4	2CCP-PSSH 883A3	260'	Accept
BZ 11 BA-2	2SVV-PSSP 058A3	260'	Accept
BZ 19 QN-1	2SWP-PSST 511A3	249'	Accept
BZ 19 GF-5	2SWP-PSR 865A3	175'	See Findings Section
BZ 11 CY-3	2SVV-PSSP 117A3	246'	Accepted
BZ 19 MC-3	2SWP-PSST 403A3	184'	(Auxiliary Bldg) Hold Tag Issued For Loose Bolting Assembly
BZ 11 KX-2	2SVV-PSSP 368A3	143'	Accepted
BZ 19 UJ-2	2SWP-PSR 627A3	242'	Accepted
BZ 13 Q-1	2RHS-PSSP 127A2	201'	Accepted



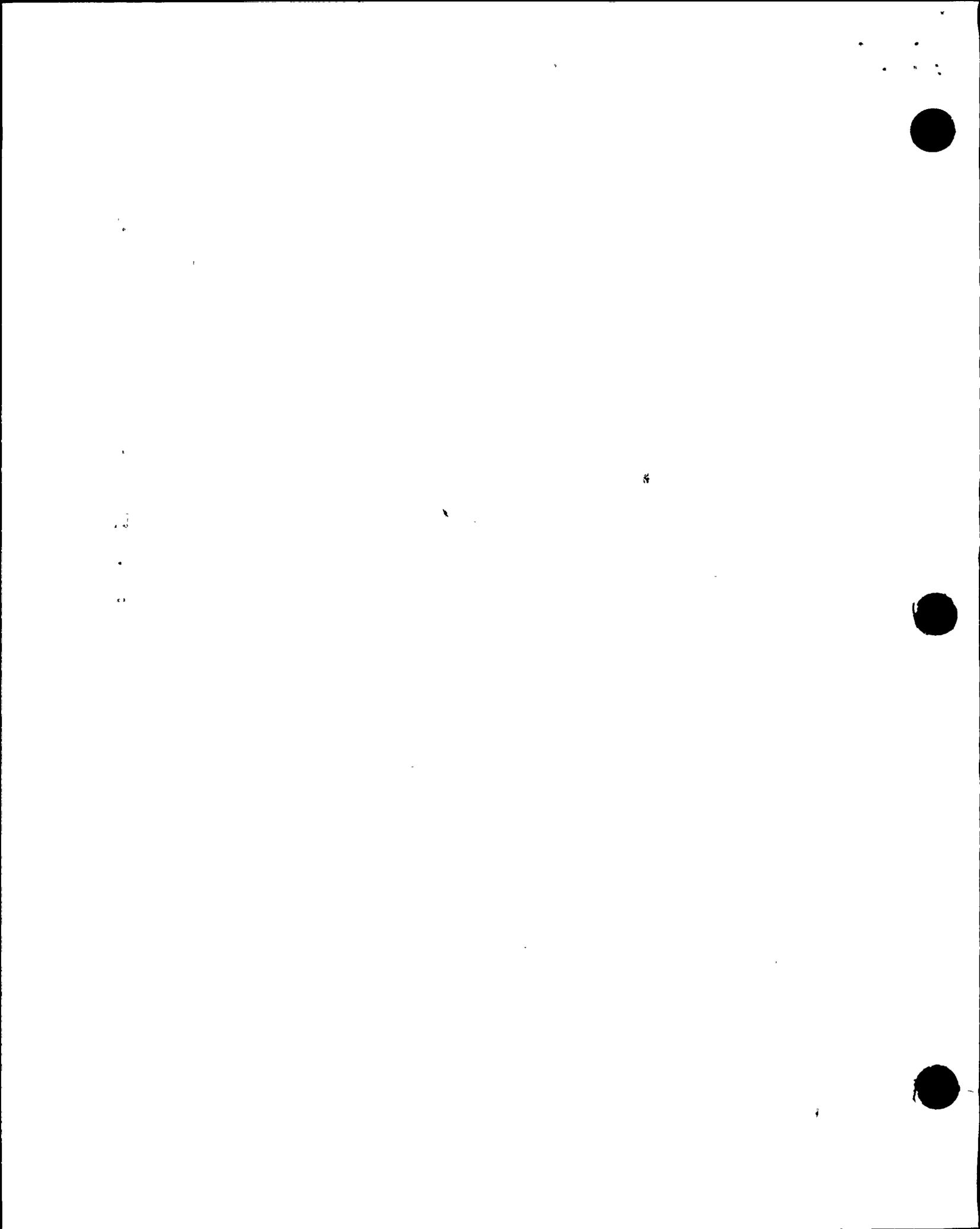
ATTACHMENT 2A

DOCUMENTS REVIEW

1. List of supports identified by Niagara Mohawk as unacceptable out of a total of 50 supports inspected.
2. Memo to C. Beckham from L. Terry and IOM from L. Terry to T. Arrington: Outline of activities for reinspection of previously accepted ITT Grinnell L/B supports as directed by NMPC-QA (November 1, 1985).
3. IOM from NMPC to T. Arrington: Concurrence of NMPC for reinspection of previously accepted ITT-G L/B supports (November 5, 1985).
4. IOM from T. Arrington to L. Terry (November 26, 1984). Report of reinspection of previously accepted ITT Grinnell L/B supports as directed by NMPC-QA.
5. Letter from L. Terry to C. Beckham (November 28, 1984) providing SWEC's recommendation to NMPC as a result of their inspection of 125 supports reinspected by SWEC.
6. Letter from L. Terry to R. Berlien (ITT-Grinnell) (December 3, 1984).
7. ITT listing of supports reinspected (between December 1 and December 10, 1984) listing submitted to SWEC.
8. SWEC's IOM (from L. Terry to C. Zappile) regarding the significance of the reinspection of the 125 supports by SWEC) including breakdown of finding.
9. SWEC letter to NMPC regarding the reportability of Grinnell L/B hanger supports as 50-55(e) (December 26, 1984).
10. IOM from C. Crocker to L. Terry and a report of the engineering evaluation of the discrepancies discovered during the QA control inspection of November 26, 1984 (Date: January 16, 1985).
11. IOM from C. Crocker to L. Terry including action items initiated by engineering as a result of the engineering evaluation of reinspection of ITT-G L/B supports.
12. Letter dated February 15, 1985 from B. Charlson to C. Crocker regarding NMP Unit 2 NF hanger weld inspection (use of Code Case N-413 and revision of the FSAR).
13. IOM dated April 26, 1985 from C. Zappile to L. Terry of the actions by engineering to close the items identified by SWEC reinspections of ITT L/B supports.



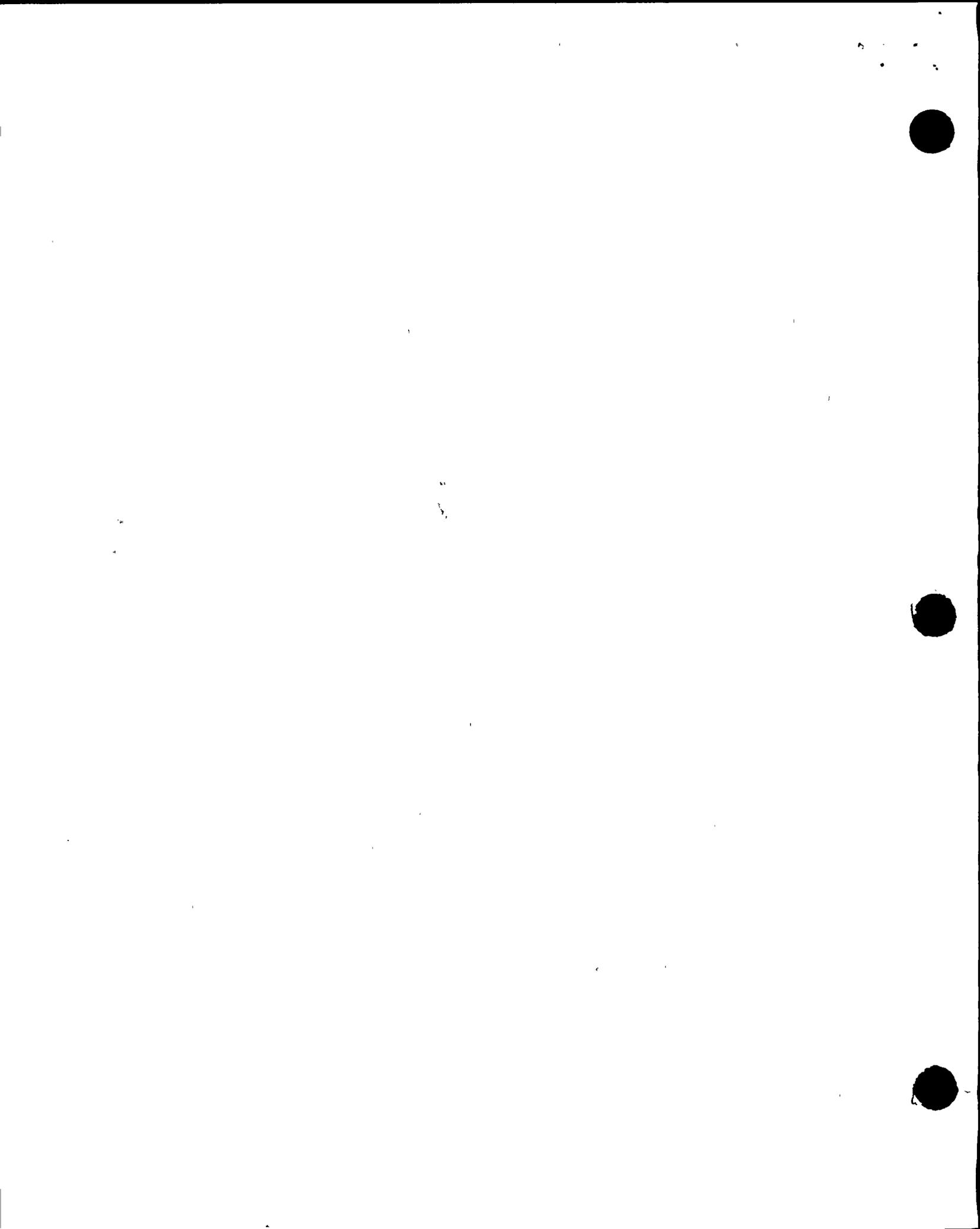
14. IOC from W. Yaeger (NMPC) to C. Crocker (SWEC) regarding the reportability of loose hardware as 50.55(e) item.
15. 10C from D. Smith/T. Seely to W. Taylor regarding SWEC overview of ITT-G pipe support inspection (Date April 30, 1984).
16. 10C from D. SMith/J. Seely to W. Taylor/T. Arrington regarding SWEC overview of the 130 supports assessed by SWEC (May 5, 1985).
17. 10C from F. Seely to F. Zinkevitch regarding SWEC overview of ITT-G pipe support inspection.
18. Letter from J. Burgers (SWEC) to F. Zinkevich (ITT-G): Clarification to SWEC letter, 9MF-677.
19. IOM from T. Arrington to L. Terry dated July 11, 1985. Reinspection results of ITT-G, L/B support by SWEC-FQC.
20. Engineering Design Coordinator Report (E&DCR #F02099B) related to the use of code case N-413.
21. E&DCR #F02174A - Related to Weld inspection criteria.
22. E&DCR #F02585A - Related to Visual weld inspection criteria.



ATTACHMENT 2B

ENGINEERING CALCULATIONS REVIEW

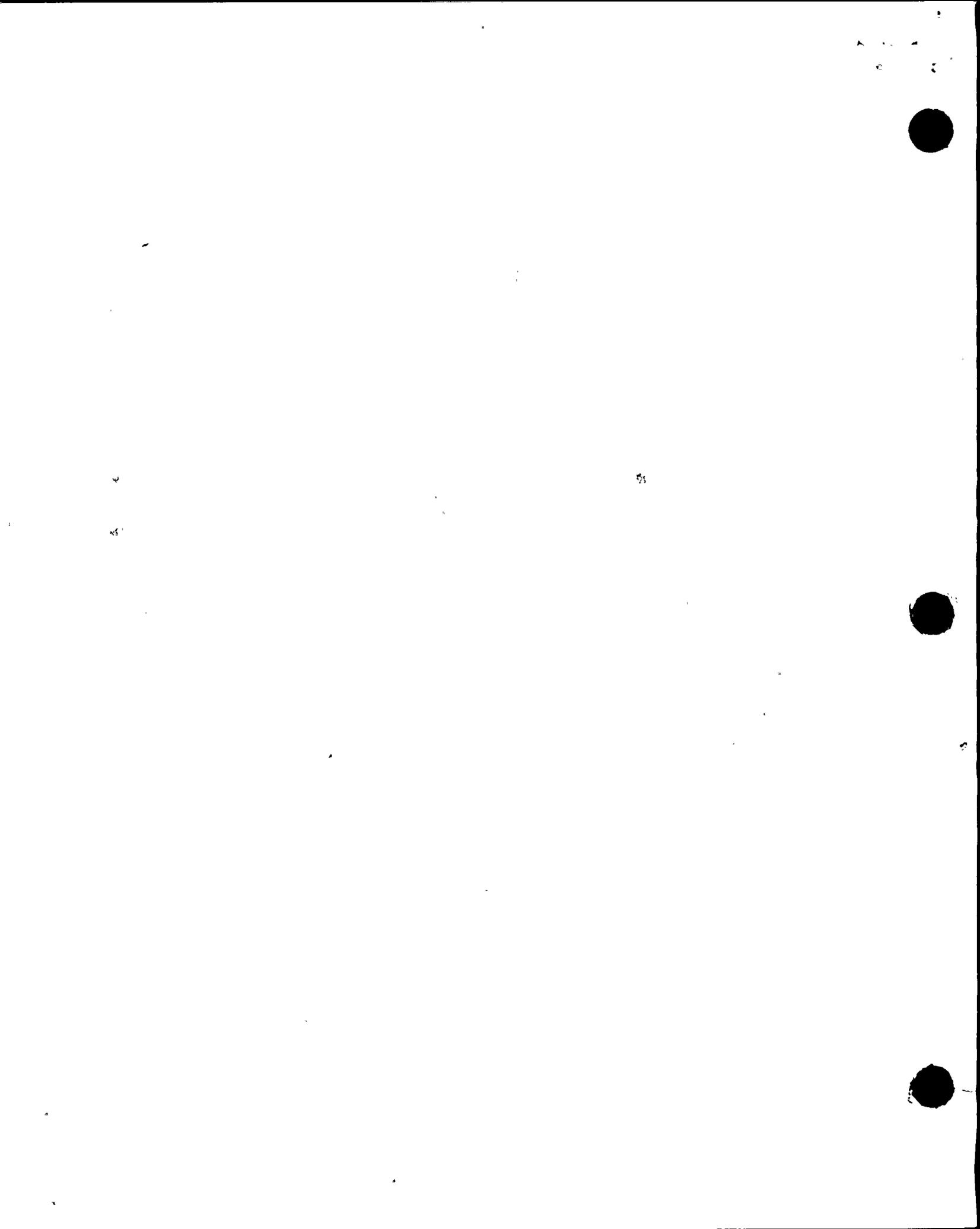
PACKAGE NO.	CALCULATION CONCERN
BZ - 2DP	Weld undercut greater than 1/32 of an inch
BZ - 2DV	Undersize due to fit-up gap greater than 1/16 inch
BZ - 11HV	Weld undersize problems
BZ - 11RY	Base metal reduction greater than 1/32 of an inch
BZ - 60G062	Problems due to lack of penetration, burn through and slag
BZ - 71KU	MT Prod marks and ground areas in face of weld
BZ - 71LK	Lack of weld wrap around on tube steel connection
BZ - 71LL	Notch effect of weld to trunion



ATTACHMENT 2C

SWEC AND ITT-G SPECIFICATION/PROCEDURE REVIEW

1. Specification No. NMPZ-P301J for Field Fabrication and Erection of Pipe Supports - ASME III, Code Classes 1, 2, 3 and ANSI B31.1.
2. Specification No. Nmp2-S203G for Drilled-In Expansion Type Concrete Anchors.
3. ITT-G Field Quality Control Procedure for Inspection of Installed Pipe Supports (FQC-4.2-14-17).
4. ITT-G Field Quality Control Procedure for System Walkdown Prior to Turn-over (FQC-4.2-26-3).
5. ITT-G Field Quality Control Procedure for Verification of Installation Operations for Mechanical Snubbers (FQC-4.2-28-5).
6. ITT-G Field Quality Control Procedure for Non-conformances (FQC-10-1-4-21).



ATTACHMENT 3

AS-BUILT PIPING AND PIPE SUPPORT STRESS RECONCILIATION

DOCUMENT REVIEW

1. Field Procedure for In-Process Verification of Piping Geometry and Pipe Support Locations.
2. Field Procedure for In-Process Verification of SWEC Installed Small Bore Piping and Pipe Supports.
3. QCI No. 10.07 for Preliminary and Final As-Built Verification of Large Bore Piping Geometry and Support Locations.
4. QCI No. 10.10 for Final As-Installed Verification of Small Bore Pipe Support Locations.
5. PP93-Procedure for Category I Pipe Stress and Supports Final Reconciliation.
6. PG 92 - Procedure for N-5 Certification Program.

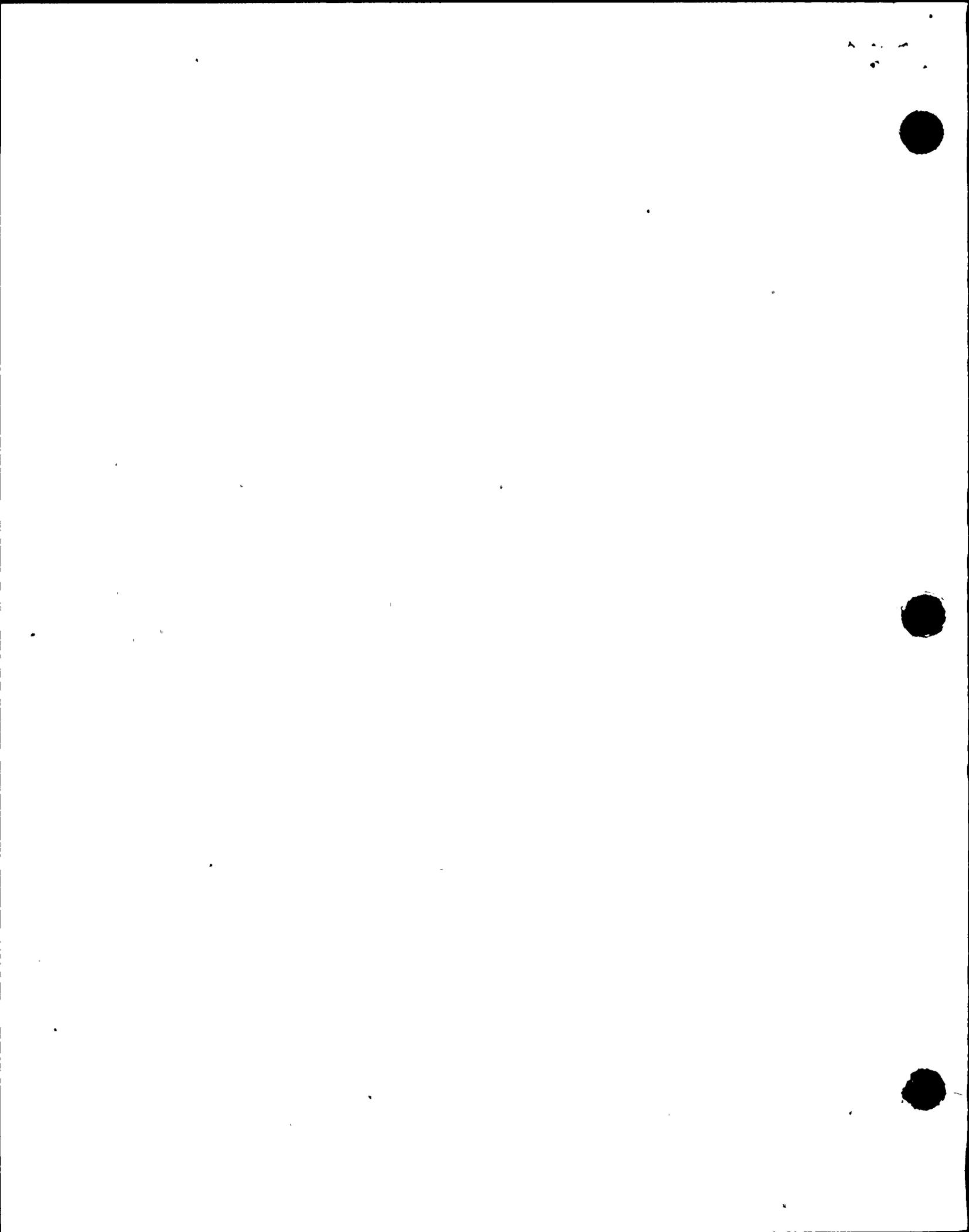
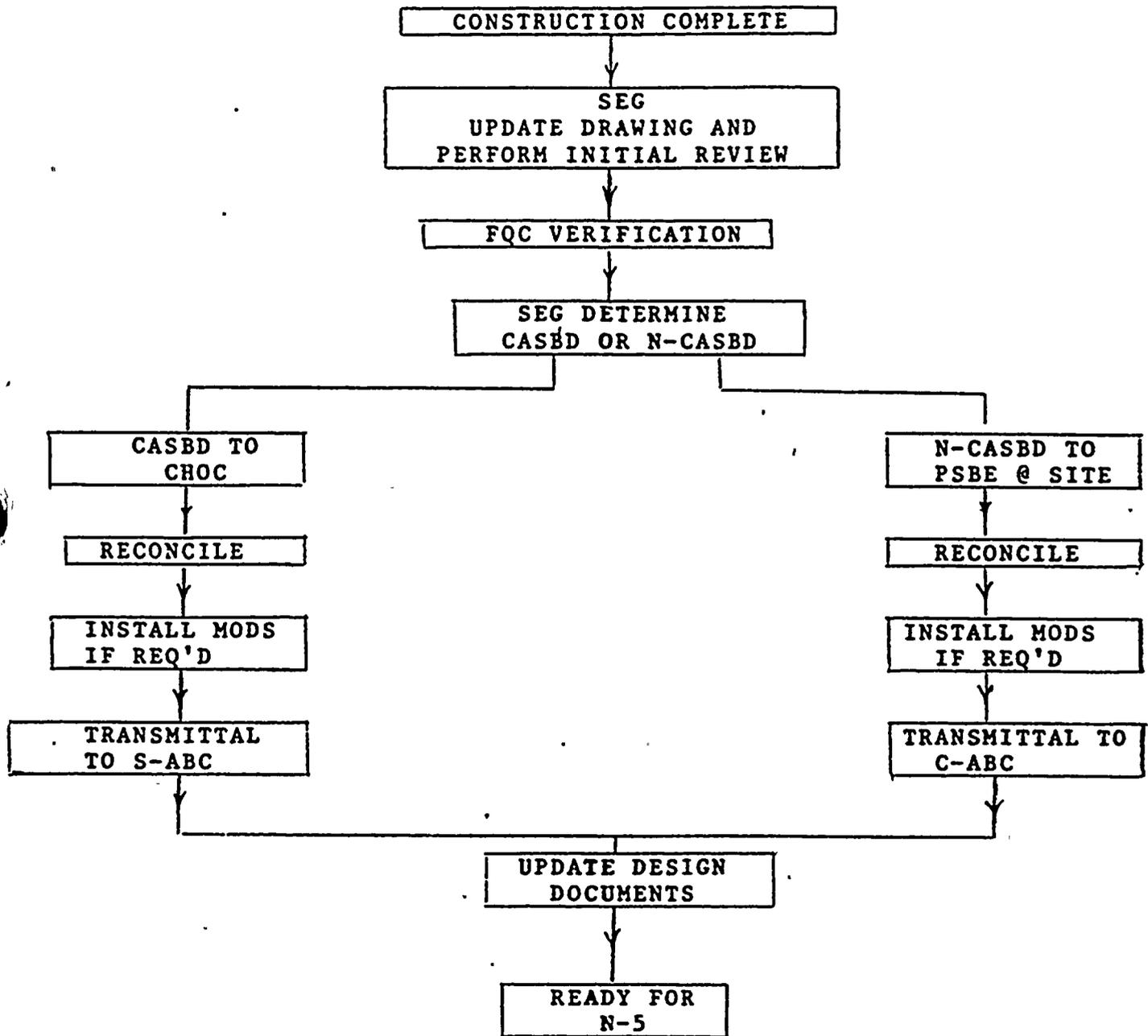


FIGURE 2: FLOW CHART FOR SMALL BORE AS-BUILT REVIEW



CASBD: Computer Analyzed Small Bore Piping Drawing
N-CASBD: Non-Computer Analyzed Small Bore Piping Drawing
S-ABC: SEG - As Built Coordinator
C-ABC: CHOC - As Built Coordinator

11

